C-A OPERATIONS PROCEDURES MANUAL

7.1.37 System Restart Following a Momentary Loss of Power

Text Pages 2 through 5

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: _____***Signature on File***_____ _____
Collider-Accelerator Department Chairman Date

S. Sakry

7.1.37 System Restart Following a Momentary Loss of Power

1. Purpose

1.1 To provide guidance on restarting the RHIC cryogenic system following an electrical power dip.

1.2 The power failure may have been of short duration and no actions have yet been taken, or the Shift Supervisor may be in the process of performing C-A OPM 7.1.24, "Helium Inventory Management During a Power Failure".

1.3 It is assumed all rotating equipment has stopped. If that is not the case, the procedure will have to be adjusted accordingly.

1.4 This procedure provides general guidance. The order of the steps and the details will need to be adjusted as conditions warrant.

2. Responsibilities

2.1 The Shift Supervisor or an operator designated by the Shift Supervisor is responsible for conducting the procedure and providing documentation in the Cryogenic Control Room Log.

2.2 Should a problem arise during this procedure, the Shift Supervisor shall report to the Technical Supervisor for instructions before continuing.

3. Prerequisites

3.1 It is assumed that all power has been restored. If it has not, the procedure will have to be adjusted accordingly.

4. Precautions

4.1 If the refrigerator pots contain liquid, all personnel entering the refrigeration wing of Building 1005R must be ODH Class 1 qualified, have a Personal Oxygen Monitor (POM), and carry and emergency escape pack.

5. Procedure

_____ 5.1 Valves H9A, H25A, H86A and H100A may have automatically closed.

- Valves H9A and H25A close when the warm turbines stop.
- Valve H86A closes when the cold turbines stop and all refrigerator pot levels are less than 5%.
- Valve H100A closes when the cold turbines stop.

_____ 5.2 If the adsorber controls are in automatic, the adsorbers will be bypassed and isolated when the outlet temperature reaches 100^{o}K. If the adsorber controls are in manual and the temperature is expected to reach 100^{o}K, bypass and isolate the adsorbers.

_____ 5.3 Restart the instrument nitrogen compressor.

_____ 5.4 Restart the ring air compressors.

_____ 5.5 If Water Services Group is not available, restart the cooling tower water pumps as follows:

Note:
The pumps are located in the building south of the water towers behind the double orange doors. Key #11 opens the door.

_____ 5.5.1 Identify the pump(s) needing restart.

_____ 5.5.2 On the Main Panel, turn the pump switch to OFF.

_____ 5.5.3 Turn the breaker OFF (switch located on top of panel).

_____ 5.5.4 Turn the breaker ON (switch located on the top panel).

_____ 5.5.5 Turn the pump switch to AUTO, green light should illuminate.

_____ 5.5.6 Go to smaller control panel on the left side of the main panel. Press the START button for the desired pump.

Note 1:
If a pump or all pumps should shut down, they should come back on automatically as follows:

1. **5 minute motor cooldown period.**
2. **1 minute delay.**
3. **15 second delay for each motor; i.e., pump #1 will start, pump #2 will start 15 seconds later, pump #3 will start 30 seconds later and pump #4 will start 45 seconds later.**

Note 2:
If after following the above procedure the pump does not start, switch the pump switch from AUTO to HAND ON. This will run the pump but may bypass any safety systems, which could result in damage to the pump. If this mode is necessary for Cryogenic System Operation, proceed with the turn on and notify the main control room (4662) of the need to send a qualified operator.

_____ 5.6 Ensure compressor room ventilation fans are operating.

Note:
It is possible for the compressor room valves to get "out of sync" with the control screen. If this happens, it may be necessary to send an open command to a valve that shows open or a close command to a valve that shows closed prior to operating the valve.

_____ 5.7 Ensure compressor room valve H3027A is open.

_____ 5.8 Restart first and second stage compressors.

_____ 5.9 Ensure the refrigerator room ventilation fans are operating.

_____ 5.10 Restart seal gas compressor.

_____ 5.11 Restart warm turbines.

Note:
Check the heat shield pressure at the 6:00 VB. if the pressure is less than compressor discharge, it will be necessary to cycle valve H25A (in the next step) to avoid exceeding compressor capacity.

_____ 5.12 When the warm turbine outlet temperature is near normal operating temperature, open heat shield supply valve H25A.

_____ 5.13 Adjust heat shield return valve, H9A to establish flow (normally 300 g/s), place in "AUTO."

_____ 5.14 Establish supply flow by adjusting valves H86A and H100A, place in "AUTO" when practical.

Note:
Before attempting to restart the circulators, the control power circuit breaker (located in the 6:00 service building) must be cycled.

_____ 5.15 Restart the Yellow____ and Blue____ circulators (magnet line must be at least 2.5 atm to start).

_____ 5.16 Restart cold turbines.

_____ 5.17 Restart cold vacuum pump.

_____ 5.18 Ensure all insulating vacuum systems are operating.

_____ 5.19 Reestablish refrigerator pot levels and normal flow parameters to ring.

_____ 5.20 If adsorber is bypassed and above 100^{o}K, it must be purged, cooled down and placed back online (O_2 levels must be less than 10 ppm prior to placing it back online), or the fresh adsorber may be put online.

6. Documentation

6.1 The check off lines on the procedure are for place keeping only. The procedure is not to be initialed or signed, it is not a record.

6.2 The Shift Supervisor shall document the completion of the procedure in the Cryogenics Control Room Log.

7. References

None

8. Attachments

None